

FORM PTO 1390
(REV 5-93)

US DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY DOCKET NUMBER
2001_1648ATRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. §371U.S. A
(if known)
NEW

10/009169

International Application No.
PCT/JP00/03708International Filing Date
June 7, 2000Priority Date Claimed
June 10, 1999

Title of Invention

COATING MATERIALS FOR CONFECTIONERY/BAKERY USE AND PROCESS FOR PRODUCTION THEREOF

Applicant(s) For DO/EO/US

Takahiro KITANO, Kazutoshi MORIKAWA and Koji UMENO

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. §371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. §371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. §371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. §371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. §371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. §371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. §371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19.
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. §371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. §371(c)(5)).

Items 11. to 14. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☒ Other items or information: (a) PCT Request; (b) Forms PCT/IB/301, 304, 308 and 332; (c) International Search Report; and (d) First page of published International Application (WO 00/76328).

U.S. APPLI NEW 10/009169	INTERNATIONAL APPLICATION NO. PCT/JP00/03708	ATTORNEY'S DOCKET NO. 2001 1648A
--	--	--


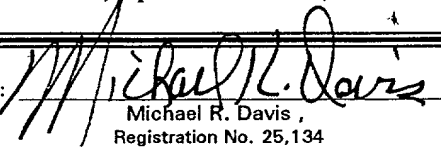
15. <input checked="" type="checkbox"/> The following fees are submitted BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): Neither international preliminary examination fee nor international search fee paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00 International Search Report has been prepared by the EPO or JPO \$ 890.00 International preliminary examination fee not paid to USPTO but international search paid to USPTO \$ 740.00 International preliminary examination fee paid to USPTO but claims did not satisfy provisions of PCT Article 33(1)-(4) \$ 690.00 International preliminary examination fee paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$ 100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =	CALCULATIONS	PTO USE ONLY																								
	\$890.00																									
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	\$																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:20%;">Claims</th> <th style="width:20%;">Number Filed</th> <th style="width:20%;">Number Extra</th> <th style="width:20%;">Rate</th> <th style="width:20%;"></th> <th style="width:20%;"></th> </tr> <tr> <td>Total Claims</td> <td>32 -20 =</td> <td>12</td> <td>X \$18.00</td> <td>\$216.00</td> <td></td> </tr> <tr> <td>Independent Claims</td> <td>2 - 3 =</td> <td>0</td> <td>X \$84.00</td> <td>\$</td> <td></td> </tr> <tr> <td colspan="3">Multiple dependent claim(s) (if applicable)</td> <td>+ \$280.00</td> <td>\$</td> <td></td> </tr> </table>	Claims	Number Filed	Number Extra	Rate			Total Claims	32 -20 =	12	X \$18.00	\$216.00		Independent Claims	2 - 3 =	0	X \$84.00	\$		Multiple dependent claim(s) (if applicable)			+ \$280.00	\$			
Claims	Number Filed	Number Extra	Rate																							
Total Claims	32 -20 =	12	X \$18.00	\$216.00																						
Independent Claims	2 - 3 =	0	X \$84.00	\$																						
Multiple dependent claim(s) (if applicable)			+ \$280.00	\$																						
TOTAL OF ABOVE CALCULATIONS =	\$1106.00																									
<input type="checkbox"/> Small Entity Status is hereby asserted. Above fees are reduced by 1/2.	\$																									
SUBTOTAL =	\$1106.00																									
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	\$																									
TOTAL NATIONAL FEE =	\$1106.00																									
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40 per property +	\$40.00																									
TOTAL FEES ENCLOSED =	\$1146.00																									
	Amount to be refunded	\$																								
	Amount to be charged	\$																								

a. ☒ A check in the amount of \$1146.00 to cover the above fees is enclosed. A duplicate copy of this form is enclosed.

b. ☐ Please charge my Deposit Account No. 23-0975 in the amount of \$_____ to cover the above fees.
 A duplicate copy of this sheet is enclosed.

c. ☐ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
 overpayment to Deposit Account No. 23-0975.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or
 (b)) must be filed and granted to restore the application to pending status.

19. CORRESPONDENCE ADDRESS <div style="text-align: center;">  000513 <small>PATENT TRADEMARK OFFICE</small> </div>	By:  Michael R. Davis, Registration No. 25,134 WENDEROTH, LIND & PONACK, L.L.P. 2033 "K" Street, N.W., Suite 800 Washington, D.C. 20006-1021 Phone: (202) 721-8200 Fax: (202) 721-8250 December 7, 2001
--	---

THE COMMISSIONER IS AUTHORIZED
 TO CHARGE ANY DEFICIENCY IN THE
 FEES FOR THIS PAPER TO DEPOSIT
 ACCOUNT NO. 23-0975

[CHECK NO. 47839]

[2001_1648A]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :
Takahiro KITANO et al. : Attn: BOX PCT
Serial No. NEW : Docket No. 2001_1648A
Filed December 7, 2001 :

COATING MATERIALS FOR
CONFECTIONERY/BAKERY USE AND
PROCESS FOR PRODUCTION THEREOF
[Corresponding to PCT/JP00/03708
Filed June 7, 2000]

THE COMMISSIONER IS AUTHORIZED
TO CHARGE ANY DEFICIENCY IN THE
FEES FOR THIS PAPER TO DEPOSIT
ACCOUNT NO. 23-3375

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents,
Washington, DC 20231

Sir:

Please amend the above-identified application as follows:

IN THE SPECIFICATION

Page 1, after the title of the invention, please insert:

This application is a 371 application of PCT/JP00/03708 filed June 7, 2000.

IN THE CLAIMS

Please amend 3-7 and 9-10 as follows:

3. (Amended) The coating material for the confectionery/bakery use according to Claim 1, wherein the water content is 5% by weight or less based on the total weight of the coating material for the confectionery/bakery use.

4. (Amended) The coating material for the confectionery/bakery use according to Claim 1, wherein the content of a solid fat in the oil and fat at 20°C is 45% or more, and the content of the solid fat at 35°C is 15% or less.

5. (Amended) The coating material for the confectionery/bakery use according to Claim 1, which contains, in the oil and fat, 70% or more of a laurin oil and fat and 20% or less of a total of SU2 and U3, whose content of a solid fat is 75 to 90% at 10°C, 70 to 85% at 20°C and 15 to 35% at 30°C.

6. (Amended) The coating material for the confectionery/bakery use according to Claim 1, wherein the amount of the oil and fat is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

7. (Amended) The coating material for the confectionery/bakery use according to Claim 1, wherein the amount of the sugar is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

9. (Amended) The process for producing a coated confectionery or bakery product, which comprises heating the coating material for the confectionery/bakery use according to Claim 1 to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

10. (Amended) The process for producing a coated confectionery or bakery product according Claim 8, wherein the confectionery product is frozen deserts or refrigerated confectionaries, or the bakery product is cream puffs, doughnuts or breads.

Please add new claims 11-32 as follows:

11. (New) The coating material for the confectionery/bakery use according to Claim 2, wherein the water content is 5% by weight or less based on the total weight of the coating material for the confectionery/bakery use.

12. (New) The coating material for the confectionery/bakery use according to Claim 2, wherein the content of a solid fat in the oil and fat at 20°C is 45% or more, and the content of the solid fat at 35°C is 15% or less.

13. (New) The coating material for the confectionery/bakery use according to Claim 3, wherein the content of a solid fat in the oil and fat at 20°C is 45% or more, and the content of the solid fat at 35°C is 15% or less.

14. (New) The coating material for the confectionery/bakery use according to Claim 2, which contains, in the oil and fat, 70% or more of a laurin oil and fat and 20% or less of a total of SU2 and U3, whose content of a solid fat is 75 to 90% at 10°C, 70 to 85% at 20°C and 15 to 35% at 30°C.

15. (New) The coating material for the confectionery/bakery use according to Claim 3, which contains, in the oil and fat, 70% or more of a laurin oil and fat and 20% or less of a total of SU2 and U3, whose content of a solid fat is 75 to 90% at 10°C, 70 to 85% at 20°C and 15 to 35% at 30°C.

16. (New) The coating material for the confectionery/bakery use according to Claim 4, which contains, in the oil and fat, 70% or more of a laurin oil and fat and 20% or less of a total of SU2 and U3, whose content of a solid fat is 75 to 90% at 10°C, 70 to 85% at 20°C and 15 to 35% at 30°C.

17. (New) The coating material for the confectionery/bakery use according to Claim 2, wherein the amount of the oil and fat is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

18. (New) The coating material for the confectionery/bakery use according to Claim 3, wherein the amount of the oil and fat is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

19. (New) The coating material for the confectionery/bakery use according to Claim 4, wherein the amount of the oil and fat is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

20. (New) The coating material for the confectionery/bakery use according to Claim 5, wherein the amount of the oil and fat is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

21. (New) The coating material for the confectionery/bakery use according to Claim 2, wherein the amount of the sugar is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

22. (New) The coating material for the confectionery/bakery use according to Claim 3, wherein the amount of the sugar is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

23. (New) The coating material for the confectionery/bakery use according to Claim 4, wherein the amount of the sugar is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

24. (New) The coating material for the confectionery/bakery use according to Claim 5, wherein the amount of the sugar is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

25. (New) The coating material for the confectionery/bakery use according to Claim 6, wherein the amount of the sugar is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

26. (New) The process for producing a coated confectionery or bakery product, which comprises heating the coating material for the confectionery/bakery use according to Claim 2 to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

27. (New) The process for producing a coated confectionery or bakery product, which comprises heating the coating material for the confectionery/bakery use according to Claim 3 to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

28. (New) The process for producing a coated confectionery or bakery product, which comprises heating the coating material for the confectionery/bakery use according to Claim 4 to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

29. (New) The process for producing a coated confectionery or bakery product, which comprises heating the coating material for the confectionery/bakery use according to Claim 5 to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

30. (New) The process for producing a coated confectionery or bakery product, which comprises heating the coating material for the confectionery/bakery use according to Claim 6 to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

31. (New) The process for producing a coated confectionery or bakery product, which comprises heating the coating material for the confectionery/bakery use according to Claim 7 to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

32. (New) The process for producing a coated confectionery or bakery product according Claim 9, wherein the confectionery product is frozen deserts or refrigerated confectionaries, or the bakery product is cream puffs, doughnuts or breads.

REMARKS

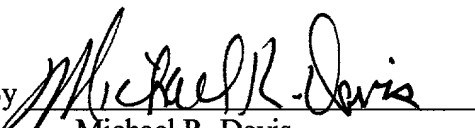
The specification has been amended to insert a cross-reference to the International Application.

The claims have been amended to avoid/correct multiple dependency, reducing the filing fee, as a result of which new claims 11-32 have been added to the application.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached pages are captioned "**Version with markings to show changes made.**"

Respectfully submitted,

Takahiro KITANO et al.

By 

Michael R. Davis
Registration No. 25,134
Attorney for Applicants

MRD/aeH
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
December 7, 2001

What is claimed is

1. A coating material for the confectionery/bakery use comprising as main components an oil and fat and a sugar, which contains coarse particles of a solid component other than the oil and fat having a particle size of 50 μm or more.

2. The coating material for the confectionery/bakery use according to Claim 1, wherein the amount of a component having a particle size of 50 μm or less in the solid component other than the oil and fat is 20% by weight or less based on the solid component other than the oil and fat.

3. The coating material for the confectionery/bakery use according to Claim 1 ~~or Claim 2~~, wherein the water content is 5% by weight or less based on the total weight of the coating material for the confectionery/bakery use.

4. The coating material for the confectionery/bakery use according to ~~any one of~~ Claim 1 ~~to~~ ~~Claim 3~~, wherein the content of a solid fat in the oil and fat at 20°C is 45% or more, and the content of the solid fat at 35°C is 15% or less.

5. The coating material for the confectionery/bakery use according to ~~any one of~~ Claim 1 ~~to~~ ~~Claim 4~~, which contains, in the oil and fat, 70% or more of

10009169-120701

a laurin oil and fat and 20% or less of a total of SU2 and U3, whose content of a solid fat is 75 to 90% at 10°C, 70 to 85% at 20°C and 15 to 35% at 30°C.

5 6. The coating material for the
confectionery/bakery use according to ~~any one of Claim 1 to~~
~~claim 5~~, wherein the amount of the oil and fat is 25 to 75%
by weight based on the coating material for the
confectionery/bakery use.

10 7. The coating material for the
confectionery/bakery use according to ~~any one of Claim 1 to~~
~~claim 6~~, wherein the amount of the sugar is 25 to 75% by
weight based on the coating material for the
confectionery/bakery use.

15 8. A process for producing a coating material for
the confectionery/bakery use, which comprises heating raw
materials comprising as main components an oil and fat and
a sugar, which contain coarse particles of a solid
component other than oil and fat having a particle size of
50 μ m or more, to above a temperature at which the oil and
20 fat melt, and then solidifying the resulting mixture
without substantial decrease of the particle size of the
solid component other than oil and fat.

25 9. The process for producing a coated
confectionery or bakery product, which comprises heating
the coating material for the confectionery/bakery use

10009169-120701

according to ~~any of~~ Claim 1 to ~~Claim 7~~ to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

- 5 10. The process for producing a coated confectionery or bakery product according Claim 8 ~~or Claim~~ ~~9~~, wherein the confectionery product is frozen deserts or refrigerated confectionaries, or the bakery product is cream puffs, doughnuts or breads.

10009169-120701

COATING MATERIALS FOR CONFECTIONERY/BAKERY USE AND
PROCESS FOR PRODUCTION THEREOF

Technical Field

5 The present invention relates to coating materials for the confectionery/bakery use and to coated confectionaries or bakeries.

Background Art

10 There have been heretofore used a glaze as well as a fondant and a chocolate fondant as coating materials with an object to provide confectionaries and bakeries with sweetness. These materials are prepared by dissolving at least a large portion of a sugar in water and a liquor, and
15 are coated on the confectionaries and bakeries to deposit the sugar afterward, where a uniform coating cannot be made unless the amount of water is quite strictly controlled.

20 In addition, the coated products, though not immediately after the production, absorb water from the confectionaries and bakeries or absorb the moisture from the atmosphere with the passage of time to generate stickiness on a touch with the hand, which possibly results in an uncomfortable feeling at eating them. Also, there has been a problem that, in the case where the coated
25 products are placed in a bag for take-out and storage, the

sugar part sticks to the bag, thereby possibly resulting in an uncomfortable feeling also at the time of pulling out them.

5 Disclosure of the Invention

During the course of a variety of investigations to obtain coating materials without having the above-mentioned defects, the present inventors had an idea of using an oily raw material that is substantially free of water, but it was recognized that, in the case where chocolate, which is an oily raw material that is substantially free of water, was used, an alien feeling was yielded without having a transparency like a glaze as well as an appearance and a coarse eating feeling of sugar like a fondant, thereby leading to the finding that the chocolate could not become a substitute.

In the course of further investigations, the present inventors have found that, by keeping the particle size of a solid component other than the oil and fat of chocolate greatly higher than that of chocolate, the appearance and the eating feeling can be made analogous to those of the glaze and the fondant, and in addition, the sticky property, which had been heretofore generated with the passage of time after the coating, can be significantly improved, thereby resulting in the completion of the

present invention.

That is, the present invention is a coating material for the confectionery/bakery use comprising as main components an oil and fat and a sugar, which contains coarse particles of a solid component other than oil and fat having a particle size of 50 μm or more; a process for producing coating material for the confectionery/bakery use, which comprises heating raw materials comprising as main component an oil and fat and a sugar, which contain coarse particles of a solid component other than the oil and fat having a particle size of 50 μm or more, to above a temperature at which the oil and fat melt, and then solidifying the resulting mixture without substantial decrease of the particle size of the solid component other than oil and fat; as well as a process for producing coated confectionery or bakery product, which comprises heating a coating material for the confectionery/bakery use to heating above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

Best Mode for Carrying out the Invention

The coating material for the confectionery/bakery use referred to in the present invention is composed of an oil and fat, and a sugar or a solid component other than

oil and fat and sugar, where an oil and fat and a sugar can be mainly utilized. As for a solid component other than oil and fat and sugar, a milk product, a cacao mass, a cheese powder, a coffee powder, a fruit juice powder and the like can be utilized to give a variety of flavor to the coating materials for the confectionery/bakery use. The addition amount of the solid component other than oil and fat and sugar is preferably 20% by weight or less based on the total weight of the coating materials for the confectionery/bakery use.

It is preferred that the coating materials for the confectionery/bakery use referred to in the present invention comprise an oil and fat and a sugar as the main components and contain coarse particles of a solid component other than oil and fat having a particle size of 50 μm or more. It is preferred that the component having a particle size of 50 μm or less in the solid component other than oil and fat is in an amount of 20% by weight or less of the solid component other than oil and fat. When the lower limit is exceeded, the eating feeling becomes less crispy, and, in the case of comprising an oil and fat and a sugar, transparency is difficult to be shown, and a coated appearance like a glaze and a fondant is not yielded. Also, in the case where a solid component other than oil and fat and sugar is added, a flavoring effect consistent with the

addition amount cannot be expected.

Examples of the oil and fat to be used for the coating materials for the confectionery/bakery use of the present invention may include, for example as the raw material, a vegetable oil and fat such as rapeseed oil, soybean oil, sunflower seed oil, cottonseed oil, peanut oil, rice bran oil, corn oil, safflower oil, olive oil, kapok oil, sesame oil, evening primrose oil, palm oil, shea butter, Saru butter, cacao butter, coconut butter, palm kernel oil or the like, and an animal oil and fat such as milk fat, beef tallow, lard, fish oil, whale oil or the like, as well as a modified oil and fat (having the melting point of about 10 to 40°C) that is prepared by subjecting such an oil and fat to hydrogenation, fractionation, interesterification or the like.

In the case where a coating material for the confectionery/bakery use is coated on a dough, and the coated dough is stored at 5°C or above, the content of a solid fat at 20°C is preferably 45% or more, and the content of a solid fat at 35°C is preferably 15% or less, on the basis of the total amount of the oil and fat in the coating material for the confectionery/bakery use. More preferably, the oil and fat in the coating material for the confectionery/bakery use contain 70% or more of a laurin oil and fat and 20% or less of a total of SU2 and U3, and

the content of a solid fat therein is preferably 75 to 90% at 10°C, 70 to 85% at 20°C and 15 to 35% at 30°C. As for the laurin oil and fat, there can be used coconut oil, palm kernel oil or a hardened oil such as a fractionated, high-melting portion of palm kernel oil or the like. The iodine value of each of the hydrogenated oil shall be 15 or less and preferably 10 or less. The melting point of such an oil and fat shall be 30 to 40°C, which is necessary for making the skeleton after solidification of the coating material for the confectionery/bakery use. As for the raw material containing SU2 and U3 (S refers to a saturated fatty acid and U refers to an unsaturated fatty acid), there can be used a vegetable oil and fat, which is collected from rapeseed, soybean, sunflower, safflower, palm or the like, then purified and modified (hydrogenation, fractionation, interesterification or the like). Such SU2 and U3 act to soften the coating material so as to be smoothly cut with a knife and to be not cracking, and also act to provide the coating material with a luster.

In the case where a coating material for the confectionery/bakery use is coated on a dough and the coated dough is stored at 5°C or below, the melting point of the oil and fat is preferably about 10 to 30°C, and the content of a solid fat therein is preferably 35 to 75% at 10°C, 7 to 45% at 20°C and 5% or less at 30°C. Hereupon,

the content of a solid fat (SFC) can be determined according to the method of IUPAC 2.150 (Solid Content Determination in Fats by NMR).

5 The content of the oil and fat in the coating materials for the confectionery/bakery use is preferably 25 to 75% by weight. More preferably, it is made to be 28 to 50% by weight. When the content of the oil and fat exceeds 75% by weight to make the oil and fat too much and the sugar little, the sweetness and the eating feeling like a
10 glaze and a fondant cannot be obtained. When the content of the oil and fat is 25% by weight or below to make the oil and fat too little and the sugar much, the coating materials for the confectionery/bakery use are not flowable even with heating, thereby being not able to be used for
15 the purpose of coating like a glaze and a fondant.

The sugar to be used in the coating materials for the confectionery/bakery use of the present invention may be exemplified by cane sugar, malt sugar, grape sugar, powdered candy, fruit sugar, milk sugar, trehalose,
20 powdered maltose or the like. The content of the sugar is preferably 25 to 75% by weight. More preferably, it is made to be 50 to 72% by weight. The sugar to be used herein preferably has a particle size of 50 μm or more and about 1 mm or less.

25 The solid component other than an oil and fat and

a sugar to be used in the coating materials for the confectionery/bakery use of the present invention may be exemplified by a milk product such as a whole milk powder, a skim milk powder, a cream powder, a whey powder, a butter milk powder or the like, a cacao component such as a cacao mass, a cocoa powder, a modified cacao powder or the like, a cheese powder, a coffee powder, a fruit juice powder or the like. The solid component other than an oil and fat having a particle size of 50 μm or less shall be in an amount of 20% by weight or less, preferably 10% by weight or less, in the solid component other than an oil and fat. When the amount exceeds 20% by weight, the eating feeling of the coating materials for the confectionery/bakery use becomes less crispy, and, in the case of comprising an oil and fat and a sugar, transparency is difficult to be shown, and a coated appearance like a glaze and a fondant is not yielded. Also, in the case where a solid component other than oil and fat and sugar is added, a flavoring effect consistent with the addition amount cannot be expected further. Also, when said solid component having a particle size of 1 mm or more increases, the dispersibility of the sugar in the oil and fat is receded.

In the present invention, the water content based on the total weight of the coating material for the confectionery/bakery use is preferably 5% by weight or less.

When the water content exceeds 5% by weight, the viscosity of the coating material becomes higher to make the coating operation difficult to perform.

As for the confectionery or bakery products to be coated with the coating material for the confectionery/bakery use, which are referred to in the present invention, the confectionery products include a frozen desert and a refrigerated confectionery, where the frozen desert may be specifically exemplified by ice cream, ice milk, lact milk, sherbet or the like. The refrigerated confectionery may be exemplified by a cake, a pudding, a jelly, Bavarian cream or the like. Also, the bakery products may be exemplified by a cream puff, a doughnut, a bread or the like.

The process for production of the coating materials for the confectionery/bakery use of the present invention may comprise melting to mix all of the raw materials at once, whereas the dispersibility is improved by adding a part of melted oil and fat afterward. As needed, a food color, an emulsifier and a flavor are added. The thus-obtained, pastry mixed dispersion contains coarse particles of the solid component other than oil and fat having a particle size of 50 μm or more, where the particle size is modulated. When the particles are micronized too much, a transparency like a glaze, an appearance and a

coarse feeling of the sugar like a fondant are not obtained. This pastry mixed dispersion is solidified without substantially decreasing the particle size of the solid component other than oil and fat. The solidified shape may be any of a block shape, a plate shape, a dice shape, a pellet shape or a particle shape. Also, it may be packed and solidified in a container such as a spout bag, which is fitted with an extrusion nozzle, or the like.

The method for applying the above-mentioned coating materials on confectionery products or bakery products may be any method that is selected from an enrober method, a line drawing method, a dipping method and the like, which can be operated by the manual work or by employing a machine such as an enrober or the like. The coating conditions comprise melting the coating material for the confectionery/bakery use in a water bath kept at 40 to 50°C, as in the case of an ordinary raw chocolate coating, then lowering the material temperature to about 40°C and coating the resulting material on frozen deserts, refrigerated confectionaries, cream puffs, doughnuts, breads or the like. When the cream puffs, the doughnuts or the breads, which are thus coated with the coating material, are stored, they do not suffer from the stickiness and the sugar-sagging. Even in the case where the water content of the confectionaries or bakeries exceeds 30%, the coated

confectionaries or bakeries are not easy to induce the stickiness and the sugar-sagging during the storage after the coating.

5 Examples

10 The present invention is illustrated in more detail by the following examples, but the examples are not intended to restrict the spirit of the present invention. In the examples, all the percents and parts except SFC are by weight.

15 When employed in the following Examples and Comparative Examples, a commercially available powdered sugar (manufactured by Kabushiki Kaisha Aritomo Shoten) was used as the powdered sugar, "TREHAOSE" (distributed by Kabushiki Kaisha Hayashibara Shoji) as trehalose, a commercially available instant coffee (manufactured by Nestle Japan Kabushiki Kaisha) as the coffee powder and "GMDF950" (manufactured by DELFI Company) as the cocoa powder. A universal mixer manufactured by Dalton was used
20 as the mixer.

Example 1

25 Into 60 parts of the powdered sugar (the particle size: 70 to 100 μm) were mixed uniformly 20 parts of a hardened rapeseed oil (SFC at 20°C: 49.1%; SFC at 35°C: 4.6%), which was melted at 50°C, by the use of the mixer to

prepare a paste, into which additional 20 parts of the hardened rapeseed oil that was melted at 50°C as well as appropriate amounts of lecitin and a perfumery were then added to mix, and the resulting mixture was solidified to a block shape by cooling without rolling. The water content thereof was 1.0%. The thus-prepared coating material for the confectionery/bakery use was coated on commercially available, ring doughnuts having the water content of 30% (the weight of each was about 30 g). The coating method comprised dipping the top of each of the ring doughnuts upside down in a bath, in which the coating material was maintained at the material temperature of about 40°C, to coat about 7.5 g of the coating material on the top of each of the ring doughnuts. After the coating material was solidified, each of the coated ring doughnuts was packaged in a sealed bag, and was stored at 10°C and 20°C for 1 day and 3 days. The products were examined for the eating feeling, the flavor and the appearance soon after the making, as well as for the conditions after the storage, especially the stickiness onto the package bag. The eating feeling of the product soon after the making was crispy in a manner similar to the case of a glaze, the flavor was good and the appearance had a transparency similar to that of a glaze. Any change was not observed on the products that were stored at 10°C and 20°C for 1 day, resulting in a

good result. After the storage for 3 days, a good result was obtained on the product stored at 10°C, whereas some stickiness was observed on the bag of the product stored at 20°C.

5 Comparative Example 1

10 An investigation was carried out in the same manner as that in Example 1, except that the mixed dispersion was rolled to make particles having a particle size of 20 to 30 μm . The products were examined for the eating feeling, the flavor and the appearance soon after the making, as well as for the conditions after the storage, especially the stickiness onto the package bag. The eating feeling of the product soon after the making was not crispy and it did not have a transparent appearance, unlike a glaze.

15 Comparative Example 2

20 Into 82 parts of Glaze Mix D-10 (manufactured by Showa Sangyou Kabushiki Kaisha) were added 18 parts of hot water, and the resulting mixture was mixed until it became uniform to obtain an ordinary glaze. The top of each of the ring doughnuts was dipped upside down in a bath, in which the glaze was maintained at the material temperature of 43°C, to coat about 1.5 g of the glaze on the top of each of the ring doughnuts. After the glaze was solidified,

25 each of the coated ring doughnuts was packaged in a sealed

bag, and was stored at 10°C and 20°C for 1 day and 3 days. The products were examined for the eating feeling, the flavor and the appearance soon after the making, as well as for the conditions after the storage, especially the stickiness onto the package bag. On the storage at 10°C and 20°C for 1 day, the sugar on the products was dissolved and stuck on the bag.

Table 1 shows the results on Example 1, Comparative Example 1 and Comparative Example 2.

Table 1 Results on Example 1, Comparative Example 1 and Comparative Example 2

	Example 1	Comparative Example 1	Comparative Example 2
Soon after making			
Eating feeling	Had crispiness like glaze	Had not crispiness like glaze	Had crispiness like glaze
Flavor	Good	Good	Good
Appearance	Transparency obtained	Transparency not obtained	Transparency obtained
Storage			
At 10°C for 1 day			
Stickiness on package bag	Not stuck on bag	Not stuck on bag	Sugar dissolved to be stuck on bag
At 20°C for 1 day			
Stickiness on package bag	Not stuck on bag	Not stuck on bag	Sugar dissolved to be stuck on bag
At 10°C for 3 days			
Stickiness on package bag	Not stuck on bag	Not stuck on bag	Sugar dissolved to be stuck on bag
At 20°C for 3 day			
Stickiness on package bag	Somewhat stuck on bag	Somewhat stuck on bag	Sugar dissolved to be stuck on bag

Example 2

Into 60 parts of the powdered sugar (the particle size: 70 to 100 μm) were mixed uniformly 16 parts of a hardened palm kernel oil (SFC at 20°C: 78.6%; SFC at 35°C: 3.8%) and 4 parts of a low melting palm oil (the iodine value: 65), which were melted at 50°C, by the use of the mixer to prepare a paste, into which additional 20 parts of the hardened palm kernel oil that was melted at 50°C as well as appropriate amounts of lecithin and a perfumery were then added to mix, and the resulting mixture was solidified to a block shape without rolling. The water content thereof was 1.0%. As for the content of the solid fat in the oil and fat component in the thus-obtained coating material, SFC at 20°C was 72.3%, and SFC at 35°C was 4.1%. The thus-prepared coating material for the confectionery/bakery use was coated on commercially available, ring doughnuts having the water content of 30% (the weight of each was about 30 g). The coating method comprised dipping the top of each of the ring doughnuts upside down in a bath, in which the coating material was melted in a water bath kept at 40 to 50°C and maintained at the material temperature of about 40°C, to coat about 6.5 g of the coating material on the top of each of the ring doughnuts. After the coating material was solidified, each of the coated ring doughnuts was packaged in a sealed bag,

and was stored at 10°C and 20°C for 3 days. The products were examined for the eating feeling, the flavor and the appearance soon after the making, as well as for the conditions after the storage, especially the stickiness onto the package bag. The eating feeling of the product soon after the making was crispy in a manner similar to the case of a glaze, the flavor was good and the appearance had a transparency similar to that of a glaze. Any change was not observed on the products that were stored at 10°C and 20°C for 1 day, resulting in a good result. After the storage for 3 days, a good result was obtained on the product stored at 10°C, whereas a slight stickiness was observed on the bag of the product stored at 20°C.

Example 3

Into 60 parts of trehalose (the particle size: 110 to 140 μ m) were mixed uniformly 16 parts of a hardened palm kernel oil (SFC at 20°C: 78.6%; SFC at 35°C: 3.8%) and 4 parts of a low melting palm oil (the iodine value: 65), which were melted at 50°C, by the use of the mixer to prepare a paste, into which additional 20 parts of the hardened palm kernel oil that was melted at 50°C as well as appropriate amounts of lecitin and a perfumery were then added to mix, and the resulting mixture was solidified to a block shape without rolling. The water content thereof was 1.0%. As for the content of the solid fat in the oil and

fat component in the thus-obtained coating material, SFC at 20°C was 72.3%, and SFC at 35°C was 4.1%. The thus-prepared coating material for the confectionery/bakery use was coated on commercially available, ring doughnuts having the water content of 30% (the weight of each was about 30 g). The coating method comprised dipping the top of each of the ring doughnuts upside down in a bath, in which the coating material was melted in a water bath kept at 40 to 50°C and maintained at the material temperature of about 40°C, to coat about 6.5 g of the coating material on the top of each of the ring doughnuts. After the coating material was solidified, each of the coated ring doughnuts was packaged in a sealed bag, and was stored at 10°C and 20°C for 3 days. The products were examined for the eating feeling, the flavor and the appearance soon after the making, as well as for the conditions after the storage, especially the stickiness onto the package bag. The eating feeling of the product soon after the making was crispy in a manner similar to the case of a glaze, the flavor was good and the appearance had a transparency similar to that of a glaze. Any change was not observed on the products that were stored at 10°C and 20°C for 1 day and 3 days, resulting in a good result.

Example 4

Into 60 parts of the powdered sugar (the particle

size: 70 to 100 μ m), 3 parts of the coffee powder and 1 part of the cocoa powder were mixed uniformly 20 parts of a hardened palm kernel oil (SFC at 20°C: 78.6%; SFC at 35°C: 3.8%), which was melted at 50°C, by the use of the mixer to prepare a paste, into which additional 20 parts of the hardened palm kernel oil that was melted at 50°C as well as appropriate amounts of lecitin and a perfumery were then added to mix, and the resulting mixture was packed to solidify in a spout bag container, which was fitted with an extrusion nozzle, without rolling. The spout bag container was soaked in a water bath kept at 40 to 50°C to melt the coating material inside, which was lineally drawn on roll breads (the water content: 30%). After the coating material was solidified, each of the roll breads was packaged in a sealed bag, and was stored at 10°C and 20°C for 1 day and 3 days. The products were examined for the eating feeling, the flavor and the appearance soon after the making, as well as for a change in the conditions after the storage. The eating feeling of the product soon after the making was crispy in a manner similar to the case of a fondant of the coffee type, the flavor was good and the appearance had a transparency similar to that of a fondant of the coffee type. Any change was not observed on the products that were stored at 10°C and 20°C for 1 day, resulting in a good result. After the storage for 3 days,

a good result was obtained on the product stored at 10°C, whereas a slight stickiness was observed on the bag of the product stored at 20°C.

Example 5

5 Into 60 parts of the powdered sugar (the particle size: 70 to 100 μm), 5 parts of a cacao mass and 15 parts of the cocoa powder were mixed uniformly 20 parts of a hardened palm kernel oil (SFC at 20°C: 78.6%; SFC at 35°C: 3.8%), which was melted at 50°C, by the use of the mixer to
10 prepare a paste, into which additional 20 parts of the hardened palm kernel oil that was melted at 50°C as well as appropriate amounts of lecithin and a perfumery were then added to mix, and the resulting mixture was solidified to a block shape without rolling (the oil component: 44.4%).
15 The thus-prepared coating material for the confectionery/bakery use was coated on commercially available, cream puffs (for each, the diameter: about 80 mm; the height: 45 mm; the weight: 67 to 70 g; a custard having the water content of about 60% was contained inside
20 as a filling material). The coating method comprised dipping the top of each of the cream puffs upside down in a bath, in which the coating material was melted in a water bath kept at 40 to 50°C and maintained at the material temperature of about 40°C, to coat about 8 g of the coating
25 material on the top of each of the cream puffs. After the

coating material was solidified, each of the coated cream puffs was packaged in a sealed bag, and was stored at 10°C and 20°C for 1 day and 3 days. The products were examined for the eating feeling, the flavor and the appearance soon after the making, as well as for the conditions after the storage, especially the stickiness onto the package bag. The eating feeling of the product soon after the making was crispy in a manner similar to the case of a chocolate fondant, the flavor was good and the appearance had a transparency similar to that of a chocolate fondant. Any change was not observed on both products that were stored at 10°C and 20°C for 1 day, resulting in a good result. After the storage for 3 days, a good result was obtained on the product stored at 10°C, whereas a slight stickiness was observed on the bag of the product stored at 20°C.

Table 2 shows the results on Example 2 to Example 5.

Table 2 Results on Example 2 to Example 5

	Example 2	Example 3
Soon after making Eating feeling	Had crispiness like glaze	Had crispiness like glaze
Flavor	Good	Good
Appearance	Transparency obtained	Transparency obtained
Storage		
At 10°C for 1 day Stickiness on package bag	Not stuck on bag	Not stuck on bag
At 20°C for 1 day Stickiness on package bag	Not stuck on bag	Not stuck on bag
At 10°C for 3 days Stickiness on package bag	Not stuck on bag	Not stuck on bag
At 20°C for 3 day Stickiness on package bag	Slightly stuck on bag	Not stuck on bag

Table 2 Continued

	Example 4	Example 5
Soon after making Eating feeling	Had crispiness like coffee-type fondant	Had crispiness like chocolate fondant
Flavor	Good	Good
Appearance	Appearance like coffee-type fondant	Appearance like chocolate fondant
Storage		
At 10°C for 1 day Stickiness on package bag	Not stuck on bag	Not stuck on bag
At 20°C for 1 day Stickiness on package bag	Not stuck on bag	Not stuck on bag
At 10°C for 3 days Stickiness on package bag	Not stuck on bag	Not stuck on bag
At 20°C for 3 day Stickiness on package bag	Slightly stuck on bag	Slightly stuck on bag

T0009169-120704

Comparative Example 3

Into 80 parts of the powdered sugar (the particle size: 70 to 100 μm) were mixed uniformly 20 parts of a hardened rapeseed oil (SFC at 20°C: 49.1%; SFC at 35°C: 4.6%), which was melted at 50°C, by the use of the mixer to prepare a paste, into which appropriate amounts of lecitin and a perfumery were then added to mix, and the resulting mixture was solidified to a block shape without rolling. In order to coat the thus-prepared coating material for the confectionery/bakery use on commercially available, ring doughnuts (the weight of each was about 30 g), the coating material was melted in a water bath kept at 40 to 50°C, but it did not become fluid, thereby being not able to dip the ring doughnuts.

Comparative Example 4

Into 20 parts of the powdered sugar (the particle size: 70 to 100 μm) were mixed uniformly 30 parts of a hardened rapeseed oil (SFC at 20°C: 49.1%; SFC at 35°C: 4.6%), which was melted at 50°C, by the use of the mixer to prepare a paste, into which additional 50 parts of the hardened rapeseed oil that was melted at 50°C as well as appropriate amounts of lecitin and a perfumery were then added to mix, and the resulting mixture was solidified to a block shape without rolling. The thus-prepared coating material for the confectionery/bakery use was coated on

commercially available, ring doughnuts (the weight of each was about 30 g). The coating method comprised dipping the top of each of the ring doughnuts upside down in a bath, in which the coating material was melted in a water bath kept at 40 to 50°C and maintained at the material temperature of about 40°C, to coat about 7.5 g of the coating material on the top of each of the ring doughnuts. As for the eating feeling and the flavor of the products after the coating material was solidified, the sweetness was low and the crispiness was missing, unlike a glaze.

Example 6

Into 40 parts of trehalose (the particle size: 110 to 140 μm) were mixed uniformly 30 parts of a hardened palm kernel oil, which was melted at 50°C, by the use of the mixer to prepare a paste, into which 30 parts of soybean oil as well as appropriate amounts of lecithin, a perfumery and a food color were then added to mix, and the resulting mixture was solidified to a block shape without rolling. The water content thereof was 1.0%. As for the content of the solid fat in the oil and fat component in the thus-obtained coating material, SFC at 20°C was 15.2%, and SFC at 35°C was 0%. The thus-prepared coating material for the frozen desert use was coated on commercially available, ice cream bars. The coating method comprised dipping the top of each of the ice cream bars upside down

in a bath, in which the coating material was melted in a water bath kept at 40 to 50°C and maintained at the material temperature of about 40°C, to coat about 9 g of the coating material on the top of each of the ice cream bars. The coating part was transparent, whereby there was yielded a transparent coating material through which the inside ice cream could be transparently seen.

Industrial Applicability

As described hereinabove, according to the present invention, the appearance and the eating feeling could be made analogous to those of a glaze and a fondant, and in addition, the sticky property, which had been heretofore generated with the passage of time after the coating, could be significantly improved.

What is claimed is

1. A coating material for the confectionery/bakery use comprising as main components an oil and fat and a sugar, which contains coarse particles of a solid component other than the oil and fat having a particle size of 50 μm or more.

2. The coating material for the confectionery/bakery use according to Claim 1, wherein the amount of a component having a particle size of 50 μm or less in the solid component other than the oil and fat is 20% by weight or less based on the solid component other than the oil and fat.

3. The coating material for the confectionery/bakery use according to Claim 1 or Claim 2, wherein the water content is 5% by weight or less based on the total weight of the coating material for the confectionery/bakery use.

4. The coating material for the confectionery/bakery use according to any one of Claim 1 to Claim 3, wherein the content of a solid fat in the oil and fat at 20°C is 45% or more, and the content of the solid fat at 35°C is 15% or less.

5. The coating material for the confectionery/bakery use according to any one of Claim 1 to Claim 4, which contains, in the oil and fat, 70% or more of

a laurin oil and fat and 20% or less of a total of SU2 and U3, whose content of a solid fat is 75 to 90% at 10°C, 70 to 85% at 20°C and 15 to 35% at 30°C.

6. The coating material for the confectionery/bakery use according to any one of Claim 1 to Claim 5, wherein the amount of the oil and fat is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

7. The coating material for the confectionery/bakery use according to any one of Claim 1 to Claim 6, wherein the amount of the sugar is 25 to 75% by weight based on the coating material for the confectionery/bakery use.

8. A process for producing a coating material for the confectionery/bakery use, which comprises heating raw materials comprising as main components an oil and fat and a sugar, which contain coarse particles of a solid component other than oil and fat having a particle size of 50 μm or more, to above a temperature at which the oil and fat melt, and then solidifying the resulting mixture without substantial decrease of the particle size of the solid component other than oil and fat.

9. The process for producing a coated confectionery or bakery product, which comprises heating the coating material for the confectionery/bakery use

according to any of Claim 1 to Claim 7 to above a temperature at which the oil and fat melt, coating the resulting material on a confectionery or bakery product and then solidifying the oil and fat component.

- 5 10. The process for producing a coated confectionery or bakery product according Claim 8 or Claim 9, wherein the confectionery product is frozen deserts or refrigerated confectionaries, or the bakery product is cream puffs, doughnuts or breads.

10009169-120701

DECLARATION AND POWER OF ATTORNEY FOR U. S. PATENT APPLICATION

() Original () Supplemental () Substitute ☒ PCT () Design

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that I verily believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Title: COATING MATERIALS FOR CONFECTIONERY/BAKERY USE AND PROCESS FOR PRODUCTION THEREOF

of which is described and claimed in:

() the attached specification, or

() the specification in the application Serial No. _____ filed _____; and with amendments through _____ (if applicable), or

☒ the specification in International Application No. PCT/ JP00/03708, filed June 7, 2000, and as amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above.

I acknowledge my duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim priority benefits under Title 35, United States Code, §119 (and §172 if this application is for a Design) of any application(s) for patent or inventor's certificate listed below and have also identified below any application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:


COUNTRY	APPLICATION NO.	DATE OF FILING	PRIORITY CLAIMED
Japan	163176/1999	June 10, 1999	Yes

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NO.	U.S. FILING DATE	STATUS: PATENTED, PENDING, ABANDONED

And I hereby appoint Michael R. Davis, Reg. No. 25,134; Matthew M. Jacob, Reg. No. 25,154; Warren M. Cheek, Jr., Reg. No. 33,367; Nils Pedersen, Reg. No. 33,145; Charles R. Watts, Reg. No. 33,142; and Michael S. Huppert, Reg. No. 40,268, who together constitute the firm of WENDEROTH, LIND & PONACK, L.L.P., as well as any other attorneys and agents associated with Customer No. 000513, to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected therewith.

I hereby authorize the U.S. attorneys and agents named herein to accept and follow instructions from Aoyama & Partners as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and myself. In the event of a change in the persons from whom instructions may be taken, the U.S. attorneys named herein will be so notified by me.

Direct Correspondence to Customer No:  000513 PATENT TRADEMARK OFFICE	Direct Telephone Calls to: WENDEROTH, LIND & PONACK, L.L.P. 2033 "K" Street, N. W., Suite 800 Washington, D.C. 20006 Phone: (202) 721-8200 Fax: (202) 721-8250
--	---

Full Name of First Inventor	FAMILY NAME <u>KITANO</u>	FIRST GIVEN NAME <u>Takahiro</u>	SECOND GIVEN NAME
Residence & Citizenship	CITY <u>Tsukuba-gun</u>	STATE OR COUNTRY <u>Ibaraki</u>	COUNTRY OF CITIZENSHIP <u>Japan JPX</u>
Post Office Address	ADDRESS <u>C/O Fuji Oil Company, Limited, Tsukuba R&D Center, 4-3, Kinunodai, Yawara-mura, Tsukuba-gun, Ibaraki, Japan</u>		
Full Name of Second Inventor	FAMILY NAME <u>MORIKAWA</u>	FIRST GIVEN NAME <u>Kazutoshi</u>	SECOND GIVEN NAME
Residence & Citizenship	CITY <u>Tsukuba-gun</u>	STATE OR COUNTRY <u>Ibaraki</u>	COUNTRY OF CITIZENSHIP <u>Japan JPX</u>
Post Office Address	ADDRESS <u>C/O Fuji Oil Company, Limited, Tsukuba R&D Center, 4-3, Kinunodai, Yawara-mura, Tsukuba-gun, Ibaraki, Japan</u>		
Full Name of Third Inventor	FAMILY NAME <u>UMENO</u>	FIRST GIVEN NAME <u>Koji</u>	SECOND GIVEN NAME
Residence & Citizenship	CITY <u>Tsukuba-gun</u>	STATE OR COUNTRY <u>Ibaraki</u>	COUNTRY OF CITIZENSHIP <u>Japan JPX</u>
Post Office Address	ADDRESS <u>C/O Fuji Oil Company, Limited, Tsukuba R&D Center, 4-3, Kinunodai, Yawara-mura, Tsukuba-gun, Ibaraki, Japan</u>		
Full Name of Fourth Inventor	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
Residence & Citizenship	CITY	STATE OR COUNTRY	COUNTRY OF CITIZENSHIP
Post Office Address	ADDRESS	CITY	STATE OR COUNTRY ZIP CODE

Full Name of Fifth Inventor	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
Residence & Citizenship	CITY	STATE OR COUNTRY	COUNTRY OF CITIZENSHIP
Post Office Address	ADDRESS	CITY	STATE OR COUNTRY ZIP CODE

Full Name of Sixth Inventor	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
Residence & Citizenship	CITY	STATE OR COUNTRY	COUNTRY OF CITIZENSHIP
Post Office Address	ADDRESS	CITY	STATE OR COUNTRY ZIP CODE

Full Name of Seventh Inventor	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
Residence & Citizenship	CITY	STATE OR COUNTRY	COUNTRY OF CITIZENSHIP
Post Office Address	ADDRESS	CITY	STATE OR COUNTRY ZIP CODE

I further declare that all statements made herein of my own knowledge are true, and that all statements on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1st Inventor Takahiro Kitano Date October 25, 2001
 2nd Inventor Kazutoshi Morikawa Date October 25, 2001
 3rd Inventor Koji Umeno Date October 25, 2001
 4th Inventor _____ Date _____
 5th Inventor _____ Date _____
 6th Inventor _____ Date _____
 7th Inventor _____ Date _____

The above application may be more particularly identified as follows:

U.S. Application Serial No. _____ Filing Date _____
 Applicant Reference Number _____ Atty Docket No. _____
 Title of Invention _____
